



SPORTSMAN AVIATION

YAK 54 85"



Building Instructions

Thank you for choosing the YAK-54. This ARF is specifically designed for extreme aerobatic manoeuvres. Your new 50cc YAK-54 ARF is a highly aerobatic airplane. It is capable of both precision and 3-D manoeuvres. The aircraft builds easily, quickly, and precisely due to its state of the art CAD design, LASER cut technology, and outstanding hardware included. We hope you enjoy building and flying your YAK-54 ARF. Great care has been taken in both the design and manufacturing of the 50cc YAK-54 ARF to allow for the strongest and lightest construction possible. Only the highest quality materials from the covering, paint, wood and hardware have been used in the construction of this model. The 50cc YAK-54 ARF has been individually hand built, covered and painted by trained and experienced Craftsmen. Using CAD design, laser cut technology and jig-built assures accuracy in all stages of production. The 50cc YAK-54 ARF is designed for gas engines in the 50-60cc category. An EVO-54 two stroke is shown in the assembly instructions. The aircraft was tested with the EVO-54 and has outstanding performance. The final choice of engine is left up to the builder. A computer radio is recommended to allow the pilot to take advantage of the full capabilities of this aerobatic aircraft.

Trust us when we say with our design you can "feel" the difference!



The Real YAK 54:-

Built by the Russians around 1993, the model 54 was designed by the Yakovlev Design Bureau as a 2 seat version for their popular YAK 55 single seat competition aerobatic aircraft. The idea was to provide an unlimited capable aircraft that had 2 seats for training and for adventure type flights. It was to also appeal to the sport aerobatic pilots around the world who wanted to compete or fly aerobatics in a world class aircraft and that also had the convenience of an extra seat.

It is powered by the brilliantly powerful and reliable Venyendev MP-14 - a 9 cylinder, 10.5 L, 360 hp, supercharged radial engine of proven design as used in the Sukhoi and other YAK aircraft. They offered a 400 hp version of the engine as well, the MP-14PF. This engine will burn 150 litres of Avgas per hour at full power, and most turn a 2.6 meter Dia. 3 blade composite and wood constant speed propeller.

Built entirely of stressed metal skins and a monocoque frame, it was to prove cheaper to manufacture and maintain than its composite constructed competitors.

The YAK 54 retained the wonderfully good flying characteristics of the YAK 55, a forgiving design that was fully capable of completing the unlimited competition sequences.

Not many of these wonderful aircraft were built and they are a rare sight at airports these days.

There is one only registered in Australia. More of the model 55's were built of which 2 reside here in Australia.

YAK 54 General characteristics:-

- Length: 6.91 m
- Wingspan: 8.16 m
- Max takeoff weight: 990 kg
- Maximum speed: 460 km/h
- Rate of climb: 3,000+ ft/min

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WARNING!!

An R/C aircraft is not a toy! If misused, it can cause serious bodily harm and property damage. Fly only in open areas, and MAAA approved flying sites. Follow all instructions included with your plane, radio, and engine.

PLEASE READ CAREFULLY BEFORE COMMENCING

This model is not a toy. It is a highly detailed functional scale model. We hope that this product will bring you hours of enjoyment and entertainment. Due to the sophisticated technical nature of this product, it is important that you carefully review all of the following warnings, cautions, and warranty terms. Likewise you should review and follow the following instructions for usage. Due to the fact that Bates Performance Hobbies is constantly improving the quality and functional characteristics of its products some details, colours, and functions may differ slightly from the images presented on the box and in the instructions.

IMPORTANT!

Before starting the assembly of your new model, please check the box inventory and inspect all parts and hardware for imperfections or damage. Notify your local hobby shop or Bates Performance Hobbies immediately if there are missing or damaged parts. Please read through the assembly manual carefully and follow the order of assembly while you are building the aircraft. This will help save time and reduce the chance of building errors. It is important to notify the place of purchase of any damage or problems with the model immediately

INTENDED USE

This plane should not be regarded as a toy. This is a potentially dangerous flying object and can cause injury to people and damage to property if an accident occurs or is not used as intended.

If you wish to return this aircraft for any reason a fee may be charged. In addition the customer is responsible for all return shipping cost and all prior shipping cost will not be refunded. Parts will be exchanged or replaced once the original item is returned at the owner's expense. If you have any problems, please contact your place of purchase or Bates Performance Hobbies.

We cannot insure the skill of the modeller and can not influence the builder during the construction or use of this aircraft, therefore, we will not be accountable for any property damage, bodily injury or death caused by this aircraft.

WARRANTY

Bates Performance Hobbies guarantees that this model is free from defects both in material and craftsmanship on the date of purchase. This guarantee does not cover any component parts damaged by use or modification. Bates Performance Hobbies liability will under no circumstances exceed the original cost of the purchased model. Moreover, Bates Performance Hobbies reserves the right to change or modify this warranty without notice.

If upon purchasing this product the buyer finds defects to the product as a result of the manufacturing process we recommend that you return this product to the place of purchase to exchange or refund the product.

Given that Bates Performance Hobbies has no control over the final assembly or use of this product, Bates Performance Hobbies shall assume no liability for damage caused resulting from the use by the user of the final user-assembled product. By using this product the user accepts all resulting liability.

If the purchaser of this product is not prepared to accept the liability associated with the use of this product, they are advised to return this model within 14 days to the place of purchase. The product must be in complete and unused condition, and must be accompanied with proof and date of receipt of purchase.

WARNINGS

- Never leave the model in direct sunlight for prolonged periods of time.
- Never fly this model near an AIRPORT, check with your local airport authorities for minimum distance to available sites.
- Never use this model near power lines, radio towers, or other locations where there is known high radio wave or electromagnetic activity.
- Do not allow water or liquid to touch the model or any of the components.
- Store the model in a cool dry location as high humidity can damage the model and its components.
- Protect the model from bumps, jolts, and concussions from other hard objects as this could damage the model.
- Keep the model clean of dust, mud and dirt.
- Never place foreign objects on top of the model.
- Use the model ONLY in wide open spaces that are free of people, or at your local RC flight club.
- NEVER use the model near populated pedestrian areas. This could lead to damage of property or injury to bystanders.
- Prior to take off, always check that transmitter and receiver batteries are fully charged and are fresh. As battery power decreases the quality of the radio signal diminishes and control over the model could fail.
- Please dispose of used batteries and electronic components in accordance with your municipal and federal Regulations relating to these types of products.
- Keep in mind that those in your vicinity may also use radio control models. Please check prior to take off that you are using a unique frequency to all those around you. Not doing so may cause you and others to lose control of the model.
- If the model does not properly respond to control inputs, land immediately and do not attempt to use the model until the cause has been determined and fixed.
- After flying, switch off the power on the model and then the transmitter.

CAUTIONS

- This product is not suitable for children under 14 years of age, adult supervision of children is highly recommended.
- This kit contains a number of small parts which are fragile and may act as choking hazards.
- Please store and assemble this model well out of the reach of small children.

- Only use batteries of the same or equivalent type.
- The power supply terminals are not to be short-circuited.
- Do not use new and old batteries together. Do not mix different brands or kinds of batteries.
- Make sure to insert batteries with correct (+) and (-) polarity.
- If the aircraft gets wet, dry it, and stop operating to avoid short-circuiting that may cause hazards.
- Do not put fingers, hair, or clothes into the shafts or rotating parts of the model.
- NEVER LEAVE CHARGING BATTERIES UNATTENDED!!!!!!

PRODUCT CONTAINS SMALL PARTS - KEEP AWAY FROM YOUNG CHILDREN
NOT SUITABLE FOR CHILDREN UNDER 14 YEARS OF AGE UNLESS SUPERVISED BY AN ADULT
COLORS, SPECIFICATIONS AND CHARACTERISTICS MAY BE DIFFERENT FROM PICTURE AND DESCRIPTIONS ON THE BOX
AND IN THE MANUAL.

Tates Performance Hobbies may be contacted by E Mail on – sales@tates.com.au or Phone 03 52224201

By choosing to operate this model, the purchaser/operator accepts all responsibility of any and all structural or mechanical failures.

Preparation and Improvements

There are a few areas where, at this unassembled stage, you can improve the final results of your assembly project. There are many items that cannot be addressed on the assembly line due to cost and possibly because not every improvement would be welcomed by every builder. Here are a few items that have come up over time.

Clean out the hinge holes. Without removing any wood, use a very sharp X-acto knife and remove any covering that may have been pushed into the hinge holes. It is very important that the glue sticks to the wood and not to the covering.

Hardening holes. The fuselage sides on this plane are made of balsa which in certain areas is doubled by lite ply.

Using wood screws in balsa is difficult because balsa is very soft. It's a good idea whenever you drill a hole that must accept a wood screw to put a drop of thin CA into the hole and then if necessary re-drill the hole. The CA will wick into the wood and harden it, adding strength in that area.

Reinforce the aileron servo trays.

In some cases used 1/4" x 1/8" balsa around the perimeter of the servo mount. Use CA or a good white glue to put the strips of balsa in. Be sure to trim away any covering so the glue sticks to the wood and not the covering.

PRE ASSEMBLY STEPS

This step is a must. This model uses very lightweight construction. During the long shipping in a closed container the climate differences can cause the film to over-shrink in some areas causing a warp in some areas. This is a common occurrence and does not indicate faulty covering or work quality. It is extremely important that you go over the tail feathers and wings (at the pre assembly stage) and look for any warp or twist in the parts. Place the rudder, elevator and ailerons on a flat surface to check for any warp. If you find any, counter twist the parts while carefully using a heat gun, hair dryer or iron to shrink the side with the wrinkles. Do it gradually and keep the heat gun far enough away to prevent burning the covering.

IMPORTANT If you will be flying your airplane using a standard radio system without mixing capabilities, you will need to plug a Y-Harness into the two aileron servo leads at this time. This will allow both aileron servos to be plugged into the aileron channel in your receiver.

IF YOU WILL BE FLYING YOUR AIRPLANE USING A RADIO WITH MIXING CAPABILITIES, YOU SHOULD PLUG EACH AILERON SERVO LEAD INTO YOUR RECEIVER SEPARATELY (ONE INTO CH. 1 AND ONE INTO CH. 6) TO TAKE ADVANTAGE OF YOUR RADIO'S MIXING CAPABILITIES.

IMPORTANT BALANCE BOTH THE PROPELLER AND THE SPINNER TO ENSURE VIBRATION-FREE OPERATION.

GOING OVER THE COVERING

Before beginning the assembly of your model remove each part from its bag for inspection. If you find any wrinkles in the covering, use a covering iron, heat gun or hair dryer to remove them. Keep in mind that this film is much thinner than Ultra-cote (to reduce the weight of this ARF) so your heat setting should be lowered. Use a very low heat setting first then increase until the iron is the proper temperature. Use caution while working around areas where the colours overlap to prevent separation of the colours. Make sure you go over the edges with your iron as well.

The covering material used on your airplane is real iron-on, heat-shrink covering material. It is possible with heat and humidity changes that the covering material on your airplane may wrinkle or sag. This trait is inherent in all types of heat-shrink material. To remove any wrinkles that might be visible you will need to use a heat-sealing covering iron.

Follow this simple procedure to remove the wrinkles:

Plug in and turn on the sealing iron to the medium-high temperature setting. Allow the sealing iron to heat up for approximately 5 - 7 minutes.

After the sealing iron has reached temperature, lightly apply the sealing iron to the wrinkled section of the covering material. Move the sealing iron slowly over the wrinkled section until the covering material tightens and the wrinkles disappear.

IMPORTANT You will notice that the colour of the covering material will darken when it is heated. When the covering material cools back down, it will return to its normal colour. If the colour layer smears from any of the seams the temperature of the sealing iron is too hot. Turn the temperature dial down and wait about 5 minutes for the sealing iron to adjust to the lower temperature. You can remove any excess colour streaks using a paper towel soaked with a small quantity of Acetone.

Make sure to test-fit the parts together before applying glue. This will ensure that the parts fit properly before gluing them together.

When gluing anything that has a smooth surface, it's important to lightly roughen the gluing surfaces with 220 grit sandpaper. This will allow the glue to stick better. Also, never glue directly to the covering material. Always remove the covering material from the gluing surfaces prior to gluing the parts together.

When cutting away the covering material from the gluing surfaces, be careful to cut only through the covering material. Try not to cut down into the balsa structure because that can compromise the integrity of the airframe.

We do not suggest storing your airplane in an extremely hot environment (like the back of your car in direct sunlight) for any length of time. The extreme heat could cause the covering material to wrinkle or sag and possibly damage the fragile components of the radio control system.

Epoxy can be cleaned up before it dries using rubbing alcohol, and C/A can be cleaned up before it dries using C/A Debonder

IMPORTANT INFORMATION ABOUT THE C/A-STYLE HINGES INCLUDED WITH YOUR AIRPLANE

The airplane uses C/A-style hinges to hinge the control surfaces. These hinges are designed to be glued into place using thin C/A. Do not glue the hinges into place using any other type of glue, such as thick C/A or epoxy. Use of any adhesive other than thin C/A could result in failure of the hinges during flight.

For flutter-free control surfaces and crisp control response, it is imperative that the hinges be glued in properly. This is achieved by having a tight hinge gap (no more than 1/32" (.7mm) wide) and using plenty of thin C/A glue. Poor hinge installation can lead to control surface flutter, which can result in a catastrophic failure of the airframe.

IF THE HINGE(S) CAN'T BE PUSHED IN FAR ENOUGH TO ACHIEVE THE PROPER HINGE GAP, YOU'LL NEED TO USE A MODELING KNIFE TO CUT THE HINGE SLOT(S) DEEPER.

MAKE SURE TO CHECK THE INTEGRITY OF THE HINGES AFTER THE C/A FULLY CURES.

IMPORTANT It is imperative that the aileron and elevator hinge gaps be sealed. Failure to do this can lead to control surface flutter, which can cause your airplane to crash. Sealing the hinge gaps will also provide crisper control response and allow the airplane to track straighter and fly truer, making trimming much easier.

It's not as necessary to seal the rudder hinge gap.

CONTROL SURFACE LINKAGES

If you don't maintain the proper mechanical advantage on the control surfaces, control surface flutter may result, which can cause your airplane to lose control and crash. Mechanical advantage refers to the distance that the pushrod attachment points (pivot points) are from the servos and the control surfaces.

Keeping the pushrods as close to the centre of the servo arms as possible will increase the servo's resolution. What this means is that when you move the control sticks on the transmitter, the servo arms will have to travel farther to achieve the desired amount of control input. This makes the resolution higher, therefore causing the control surface deflection to be more precise. We don't recommend moving the pushrods any farther away from the centre of the servo arms than absolutely necessary.

Keeping the pushrods as far away as possible from the control surfaces is better than moving them closer. The mechanical advantage is greatly reduced the closer the pushrods are moved toward the control surfaces. We don't recommend moving the pushrods any closer to the control surfaces than absolutely necessary.

Make sure that you've installed 1/4" long pieces of silicone fuel tubing over the devises and snap-keepers to prevent any

chance of them opening during flight.

If your radio transmitter is equipped with dual rate switches, double-check that they are on the low-rate setting for your first few flights.

Check to ensure that all of the control surfaces are moving the proper amount in both low and high rate settings.

Motor: The motor should run smoothly at all power settings with smooth transition from low to high RPM. Do not fly with an unreliable motor. Completely read motor instructions before flying.

Flight Controls: Ensure all flight controls are free from binding and are centered. Check all hinges are tight and will not pull out. Control linkages must be rigid and tight and have no slop. Confirm proper direction of ailerons, rudder and elevator. Experienced flyers have lost airplanes due to reversed ailerons. Right roll is right aileron up and left aileron down. Left roll is left aileron up and right aileron down.

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SETTING THE CONTROL THROWS

We recommend initially setting up the airplane using the Test Flying/Sport Flying control throws. These control throws are suggested for initial test flying and general sport flying because they will allow the airplane to fly smoother and make it easier to control. For 3D flying, use the 3D Flying control throws, but only AFTER you've become very familiar with the flight characteristics of the airplane using the Test Flying/Sport Flying control throws and only after setting up the airplane as described in this section.

Centre of Gravity: Check CG is set properly.

Turn the airplane upside down, place your fingers on the wing at the balance point, and carefully lift the airplane. If the nose of the airplane drops, the airplane is nose heavy. To correct this, move the battery pack and/or receiver back far enough to bring the airplane into balance. If the tail of the airplane drops, the airplane is tail heavy. To correct this, move the battery pack and/or receiver forward far enough to bring the airplane into balance. Because of the limited space to move the receiver and/or battery fore and aft, you may also need to add weight to the tail or the nose to balance the airplane. When balanced correctly, the airplane should sit level or slightly nose down when you lift it up with your fingers. Balance the airplane with the fuel tank empty.

PRE FLIGHT CHECKS

Batteries: Make sure Transmitter and receiver/motor batteries are fully charged before each flight. Also double check before each take off.

Fasteners: Check all motor screws, prop nuts, servo screws, control horns, wheel collars, and clevis keepers are tight and secure.

Radio: Check trims set to neutral and controls centered. Check rate and condition switches set properly. Check the receiver antenna is fully extended.

SAFETY PROCEDURES BEFORE FLIGHT

Before each flight check your transmitter and flight pack battery for proper charge levels to make sure you attain maximum flight time and safety. Always switch on your transmitter first and move the right hand throttle stick to the low throttle position to avoid accidentally starting the motor. Then only connect the plane battery to the aircraft when you are going to fly. Match the red and black wires up correctly. When you have finished the flight, unplug the LiPo flight battery before turning off the transmitter. If the plane battery is connected without the transmitter being on, it can pick up signals from other radio transmitters and cause your plane to respond unintentionally, controls will start to move as well as the motor revving up! This is not a malfunction of the system, but a standard behaviour for all radio controlled models.

Before turning on your transmitter, make sure no other people are flying other aircraft on the same frequency you are using. This will cause interference and result in crashing the other pilot's aircraft. The frequency of



your model may be determined by looking at the small orange label attached to the module in the back of the transmitter. It will show a number, this the frequency of your radio in Mhz. make sure you do not operate the model when another model of any type, or R/C car is on this frequency.

After switching on your transmitter and plane check the positions of the control surfaces on your plane. Initially they all should be in a neutral position. Adjust to the correct position when needed by turning the “kwick link” connectors attached to the push rods which operate the control surfaces.

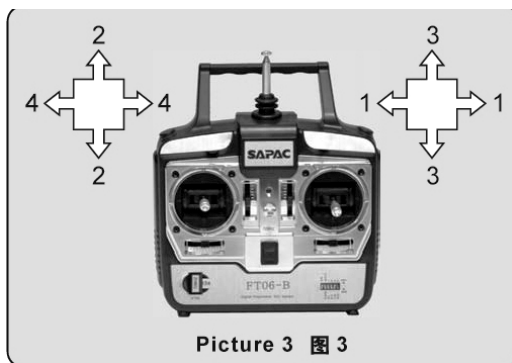
Check if the controls are moving in the correct direction for the directions the sticks are moved. Do this for ALL control surfaces! See transmitter setup below.

Avoid flying in bad weather conditions. Since you are flying a relatively light aircraft, it is not recommended to fly in high winds as the plane can travel downwind very quickly and become very difficult to retrieve!

Always keep the aircraft within visual range. It is very important that you can see which direction the plane is going. Also keep the plane away from people and objects.

If you notice that the plane is starting to loose power then it is suggested you land and recharge the LiPo pack. If you continue flying and the power is suddenly lost, it will be hard to control and land the plane in a controlled manner and could result in a crash and damage to the plane! The battery may also be damaged if it is over discharged.

You can only become a good pilot if you realise that it is most important to operate your aircraft in a secure and responsible manner. An out of control aircraft can cause damage to people and property!



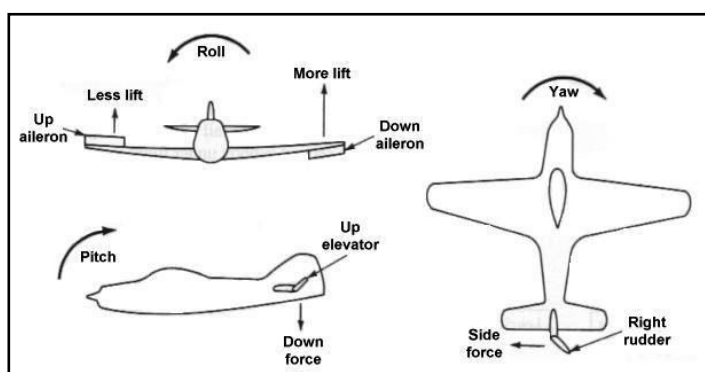
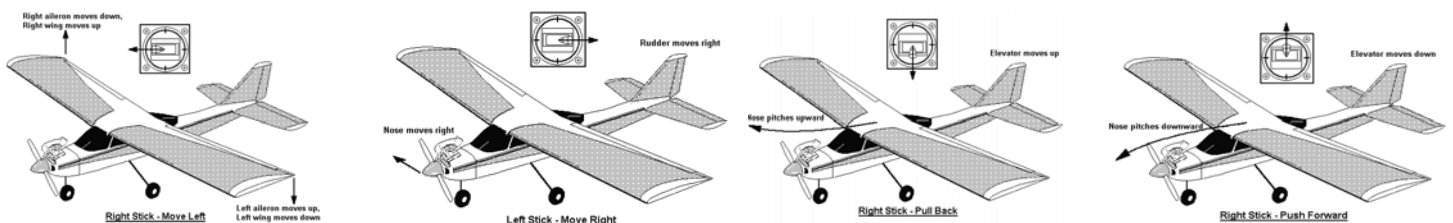
Mode 1 –

The left stick - 2, moved forward and back, gives down and up elevator, forward for dive and back for climb; moved left and right – 4 it gives left and right rudder.

The right stick - 3, moved forward and back gives high and low throttle; 1 - moved left and right it controls the ailerons, giving left and right bank.

Checking Control Surfaces for Correct Direction of Travel – VERY IMPORTANT :

The direction the model will go, depends on the direction the control surfaces move when you move the stick on the transmitter. Please check that the Ailerons (wings) and the Elevator (Tail) work in accordance with the following diagrams.



Receiver instructions:



The receiver antenna is best fully extended and routed away from other wires where practical. Run the antenna out of the fuselage and up to the top of the fin for best results. Use some tape to hold in place.

DO NOT shorten, cut or roll up the antenna as this will reduce the range of control.

If using a 2.4 Ghz Receiver – install as per the manufacturers instructions.

GETTING READY TO FLY:

Always ensure that the transmitter is switched on, that the antenna is extended fully , that the throttle lever is set at its lowest point (stick to the bottom on the gimbal) and the model is being held securely before connecting the battery, this will prevent unexpected start ups which could cause injury.

OK, so having done that, the battery can be placed in its compartment under the nose and its red plug connected to the socket inside. After a pause you will hear some “beeping” telling you that the battery, the electronic speed control and the motor are all in communication. When the beeping stops, slowly advancing the throttle will cause the motor to start and continue to speed up until full throttle is reached.

Having checked the motor, stop it by bringing the throttle lever back to full low and then, by moving the elevator, aileron and rudder sticks, check that all surfaces move in the correct direction and by the required amount. If any of these move in the wrong direction – Check the radio manufacturers manual for the reversing switches, which may be able to correct the problem.

With the trims, (they are the small sliders alongside the sticks), in the central position, check that the ailerons, rudder and elevator are properly aligned; if not, make adjustments to the appropriate clevises. Having the surfaces properly aligned with the trims in the central position will ensure that the model on its first flight will be near to being “in trim” and any minor out of trim condition will then be correctable by use of the trim sliders. You may wish to engage the assistance of a modeller with some R/C experience to guide you through this all important phase and also to cast his eye over the model to ensure all is correct.

The first task is to range check the radio equipment. Go to an area clear of trees and metal fences, like the middle of a sports field to ensure clear reception.

Checking Radio Range

The range of this radio set is about 300 to 400 metres. Before your first flight, it is a necessary to check whether you will have sufficient radio range to maintain control of the model. This is achieved by getting a helper to hold the plane while you walk away from the plane, with the radio control and plane both turned on and the aerial on the transmitter fully **down**. With everything set up correctly you should be able to walk 20 to 30 paces away before the servos begin to twitch around. If you only achieve a short distance before erratic behaviour of the servos or motor then you must not fly. Check out and rectify the problem before attempting to fly. Re-routing the aerial away from the battery and servo / motor leads will often help, or low batteries may be the course!

This can all be done on a day while you are waiting for the best weather and an experienced radio flyer is available to give you a hand.

LIMITATIONS OF FLYING AREAS :

Only fly your plane in areas that are suitable or selected for remote controlled aircraft. You must realise that certain public areas are not allowed to be used for flying remote controlled aircraft. Check with your local Council for approval before flying on sports ovals or parkland!

Keep your plane away from high power/ high voltage cables as they can cause interference of the radio control system. Interference can result in losing control of your plane, ultimately leading to a crash.

Don't fly over or towards spectators or their vehicles. Don't fly over buildings or houses. Fly where there is enough space to safely land anywhere in the surrounding area. Don't fly where there are lots of trees in the area. (trees are magnets to model aeroplanes!)

Stay away from busy roads. Flying in these areas can distract drivers and lead to an accident.

Don't fly within a 6 kilometre radius of any airport or where full sized aircraft are flying.

FIRST FLIGHTS

It will be VERY helpful if you are able to obtain help from an experienced model pilot during your first flights. It is a very good idea to find a model club in your area or at least someone that can fly RC planes. They can help with the final setup and flight testing of your plane. Making sure it is an enjoyable experience and not a disaster!

Flying a radio controlled model aircraft is difficult, due to the good hand to eye co-ordination required. Good eyesight is needed to see what the model is doing and a basic knowledge of the theory of flight is useful.

Practice – like anything worthwhile is required to master the skills for the hobby.

Accidents DO occur and damage WILL be caused to the model when this happens. So if you are not prepared to accept this – do not attempt to fly this model.

That is the bad news ! But the development of new and exciting skills and the enjoyment of seeing your own radio controlled model obeying your every command is well worth it !!

This is a great hobby for all ages and abilities, so ENJOY !!

Now, if the day has arrived when there is practically no breeze and you have found an area about the same size as a football oval with a smooth surface, place the model on the ground, facing directly into that slight breeze and have your helper hold it.

After checking again that the control surfaces are moving in the correct direction, extend the transmitter antenna, give your helper the nod and start your take off by slowly advancing the throttle to full power, at the same time holding in some up elevator to prevent a nose-dive and being ready to apply aileron to correct any tendency to roll .

Unless you have a long smooth surface to take off from – you are probably best to “hand launch” the smaller type electric powered models with the help of a friend. Some of these models are not designed to take off from grass, only smooth hard surfaces.

Hand launching is a good method to get your model airborne as there is less risk of getting caught up in holes Etc. in the runway.

Have a helper fold the model above their head, gripping the fuselage around the middle, so it is evenly balanced. While facing into any wind, run forward and “push” the model forward and slightly down so the model can attain flying speed quickly. Do not “throw” the model as this can cause an unstable launch.

DO NOT ATTEMPT THIS WITH LARGER NITRO AND GAS POWERED MODELS.

Once airborne and at about 100 feet altitude, commence your first turn by the application of aileron (Right hand stick) and a small amount of up elevator (pull back on the Left hand stick) to hold the nose into the turn. If you find that the model is getting too high, reduce throttle, then continue making turns left and right to familiarise yourself with its flight characteristics, keeping the model within clear view at a distance of no more than 200 metres. After a few minutes you'll be ready to land, so reduce the throttle setting to about 10% and prepare to land into the breeze at the end of a sweeping 180 degree approach, being ready to increase power if you are about to land short, or reduce it further if the model is about to overshoot.

TIPS FROM THE PRO'S

If you have a computer flight simulator, it is a good idea to practice with it before actually flying the model.

It is a good idea to taxi the plane around on the ground with a moderate amount of throttle. This will help you get use to the rudder ground controls.

You must learn to use only gentle movements of the controls. When using proportional radio control systems, only slight corrections are necessary to change the direction of the plane.

Do not push the joysticks to maximum deflection for more than a couple of seconds. This can result in a crash!

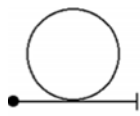
It is a very good idea to find a model club in your area or at least someone that can fly RC planes. They can help with the final setup and flight testing of your plane. Making sure it is an enjoyable experience and not a disaster!

Take off and land into the wind. Always try to keep the model in front of you.

Extra motor batteries are available – so one can be charging while flying with the other. After market chargers are available to make charge times faster.

Trimming Chart

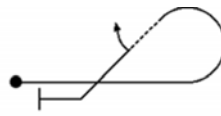
After you have test-flown and made the initial trim changes to the airplane, use this trimming chart to begin trimming your airplane. Following this chart will result in the ability to diagnose trim problems and correct those problems using the simple adjustments shown below. Making these observations and related corrections will result in an airplane that tracks



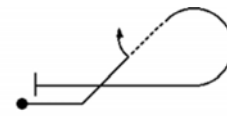
Loop
straighter and flies truer.



Cuban 8



Half Cuban 8



Reverse Half Cuban 8



Hammerhead

TRIM FEATURE	MANEUVER	OBSERVATION	CORRECTION
Control Centering	Fly general circles and random maneuvers	Try for hands off straight and level flight	Readjust linkages so the transmitter trim levers are centered
Control Throws	Fly random maneuvers	<p>A) Controls are too sensitive or airplane feels "jerky"</p> <p>B) Controls are not sensitive enough or airplane feels "mushy"</p>	<p>If A) Adjust linkages to reduce control throws</p> <p>If B) Adjust linkages to increase control throws</p>
Engine Thrust Angle*	From straight and level flight, quickly chop the throttle for a short distance	<p>A) Airplane continues in a level attitude for a short distance</p> <p>B) Airplane pitches nose up</p> <p>C) Airplane pitches nose down</p>	<p>If A) Engine thrust angle is correct</p> <p>If B) Decrease engine down thrust</p> <p>If C) Increase engine down thrust</p>
Center of Gravity	From level flight, roll to a 45° bank and neutralize the controls	<p>A) Airplane continues in the bank for a short distance</p> <p>B) Nose pitches up</p> <p>C) Nose pitches down</p>	<p>If A) Center of gravity is correct</p> <p>If B) Add nose weight</p> <p>If C) Remove nose weight or add tail weight</p>
Yaw**	Into the wind, perform inside loops using only elevator. Repeat test performing outside loops from an inverted entry.	<p>A) Wing is level throughout</p> <p>B) Airplane yaws to right in both inside and outside loops</p> <p>C) Airplane yaws to left in both inside and outside loops</p> <p>D) Airplane yaws to the right in inside loops and yaws to the left in outside loops</p> <p>E) Airplane yaws to the left in inside loops and yaws to the right in outside loops.</p>	<p>If A) Trim settings are correct</p> <p>If B) Add left rudder trim</p> <p>If C) Add right rudder trim</p> <p>If D) Add left aileron trim</p> <p>If E) Add right aileron trim</p>
Lateral Balance**	Into the wind, perform tight inside loops using only elevator	<p>A) Wing is level and airplane falls to either side</p> <p>B) Airplane falls off to the left. Worsens as loops tighten</p> <p>C) Airplane falls off to the right. Worsens as loops tighten</p>	<p>If A) Lateral balance is correct</p> <p>If B) Add weight to right wing tip</p> <p>If C) Add weight to left wing tip</p>
Aileron Control System	With the wing level, pull to a vertical climb and neutralize the controls	<p>A) Climb continues along the same path</p> <p>B) Nose tends to go toward an inside loop</p> <p>C) Nose tends to go toward an outside loop</p>	<p>If A) Trim settings are correct</p> <p>If B) Raise both ailerons very slightly</p> <p>If C) Lower both ailerons very slightly</p>

*Engine thrust angle and center of gravity interact. Check both.

**Yaw and lateral balance produce similar symptoms. Note that the fin may be crooked. Right and left references are as if you were in the cockpit.

Kit Contents:



- Pre-covered two-piece wing with aileron servo cut-out.
- Pre-slotted and trial fitted ailerons, elevator and rudder (Pin hinges).
- Pre-painted cowling.
- Pre-painted wheel pants.
- Pre painted aluminium gear struts.
- Lightweight main wheels and tail wheel.
- Linkages and control horns.
- Aluminium wing tube.
- Aluminium stabilizer tubes.
- Removable stabilizer.

ITEMS NEEDED TO COMPLETE MODEL

[Tates Performance Hobbies](#) can supply every thing that is needed to finish this plane.
[Contact your local hobby shop or Tates](#) for more details.

Motor

50 to 60cc petrol motor Recommended

Propeller

XOAR Recommended

Fuel tank

20-24oz fuel tank and fuel tube.



NOTE: Do not use supplied fuel tank it may leak.

Radio System

1 x throttle servo
2 x aileron servos
1 x rudder servo
2 x elevator servo
24kg DIGITAL Recommended

OPTIONAL

TY tail wheel
TY servo locks

Tools:

- Modeling knife.
- Electric drill and selection of bits.
- Phillips screwdriver.
- Needle nose pliers.
- Wire Cutters.
- Pins.
- Ruler and tape measure.
- Pen, pencil or felt tipped marker.
- Flat building board.
- Building squares and blocks.
- Masking tape.
- Clear tape (optional).
- TY Allen keys.

Mercury Adhesives:

- Thin CA (M5T)
- High Performance CA (M100XF)
- CA kicker (optional)
- Mercury Teflon tips.
- 30min Epoxy

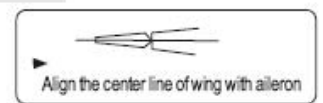
TAIL ASSEMBLY

Stablizer, Elevator assembly

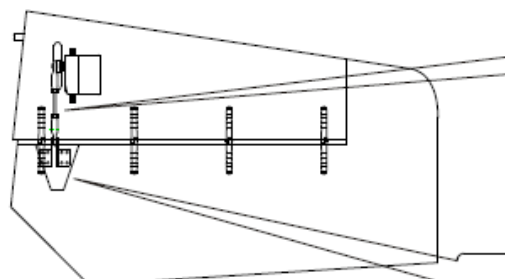
Apply Vaseline to the centre of the hinge to protect from epoxy from binding hinge.

Apply epoxy to the hinge and in to the hinge hole. Fit hinge in to the stabilizer till the pin on the centre of the hinge is level with the bevel in the stabiliser. Bend the hinge at 90 degrees so that the hinge points up or down in the same direction the elevator will hinge. This ensures you don't glue the hinge in side ways and then the elevator won't hinge properly.

Wait till the epoxy cures then glue the elevator to the stabilizer and make sure you get full deflection then tape in place till dry.



4 Stabilizer!



T3.0X 15mm Screw

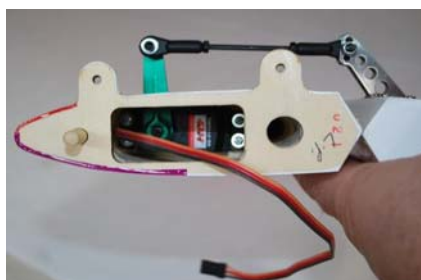
Use a hot wire to remove the covering on the stabilizer to allow the elevator servo horn to come through.

Install the servo in to the stabilizer and secure.

Fit the Air Wild servo horn to the servo at 90 degrees to the servo.

Fit the 2 ball links to the push rod supplied and mount one ball link to the servo arm and the other end to the control horn.

Align the push rod parallel to the servo arm and secure control arm to the elevator with supplied self tappers.



Slide stabilizer tube in to the tail.

Slide each stabilizer on to the wing tube.

Feed the servo wire with extension attached in to the fuselage.

Secure in place with self tappers.



T2 x 8mm Tapping Screw
.....8

Rudder assembly

Gather the rudder, hinges and epoxy materials as shown. Use 30 minute epoxy to ensure adequate working and cleanup time.

Prep all hinges for installation by applying Vaseline petroleum jelly or light oil to the Hinge joint. This ensures no epoxy gets into the hinge during assembly.

Mix epoxy in mixing cup and use a tapered stick to apply the epoxy inside the pre-drilled holes in the trailing edge of the fin.

Apply epoxy to one side of each hinge and insert the hinge completely into the hole. Ensure the hinge axis is vertical and parallel to the trailing edge of the fin before epoxy cures. Wipe away excess epoxy with alcohol wetted wipes.

Epoxy the hinges into the fin first and allow epoxy to fully cure.

Mix epoxy in mixing cup and use a tapered stick to apply the epoxy inside the pre-drilled holes in the leading edge of the rudder.

Apply epoxy to trailing edge of each hinge.

Carefully slide the rudder onto each hinge and against the trailing edge of the fin. Wipe away excess epoxy with alcohol wetted wipes.

Ensure there is no gap between fin and rudder. Allow to dry fully.



Install the rudder servo in the forward servo cut out with the output shaft to the rear.
Mark and use a 1/16 bit to drill the rudder servo mounting holes.

RUDDER PULL-PULL CABLE INSTALLATION

Gather the rudder control linkage parts shown. 2 Rudder cables, 4 threaded couplers, and 4 brass swaging tubes.

Feed the rudder cable through the cable exit tube in the tail of the fuse toward the front of the fuse.

Repeat on other side.

Insert rudder cable through the brass swage tube, then through the threaded coupler hole, and back through the brass swage tube as shown.

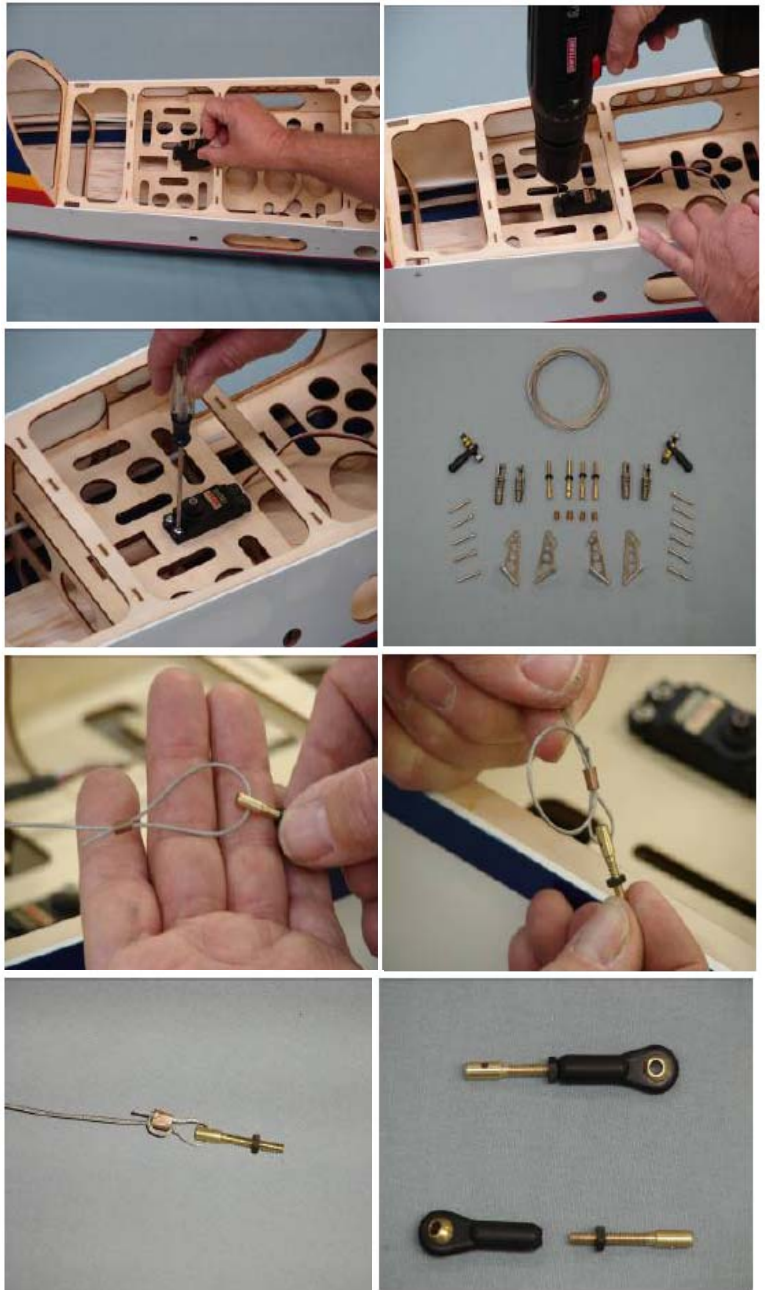
Loop the cable back through the brass swage tube as shown.

Tighten the second loop through the brass swage tube and crimp the brass tube with a crimping tool or pliers. Cut off excess cable as shown.

A drop of thin CA may be applied to the swage tube to help secure the cable

Repeat above steps for the other side rudder cable.

Attach a ball link to each threaded coupler.
Attach the ball links to the rudder servo arm and then attach the servo arm to the rudder servo as shown. A 3" Air Wild arm is recommended.



RUDDER CONTROL HORN INSTALLATION

Gather the rudder control horn parts as shown. 2 ball link assemblies and 2 left and 2 right side control horns.

Assemble the ball links between the control horns as shown.

Secure with nylon lock nut.

Use a 1/16 bit to drill control horn mounting holes.

Mount rudder control horns using six wood screws.

Repeat the above steps for mounting the other side rudder control horn.

Plug the rudder servo into the rudder channel of the receiver and power up. Turn on Transmitter to centre rudder servo.

Tape the rudder balance tab to the top leading edge of the vertical fin in the neutral position as shown.

This ensures the rudder is straight when the cables are attached.

Remove ball links from the rudder control horns.

Attach two threaded couplers to ball links as shown.

Hold the threaded coupler below the cable attach holes to thread into the ball link as shown.

Do not hold coupler at the top where the cable hole is located. This may cause burrs on the coupler that can eventually cut the rudder pull cable.

Attach ball link to rudder control horn on both sides of the rudder.

Thread the rudder cable through a brass swage tube, then the threaded coupler, and back through the brass swage tube on both sides. Pull light tension on the cable through the coupler on both sides as shown.

The loop through the coupler should be approximately 1/2" long.

Loop the cable back through the brass swage tube as shown.

Tighten the second loop through the brass swage tube as shown.

Crimp the brass tube with a crimping tool or pliers.

A drop of thin CA may be applied to the swage tube to help secure the cable.

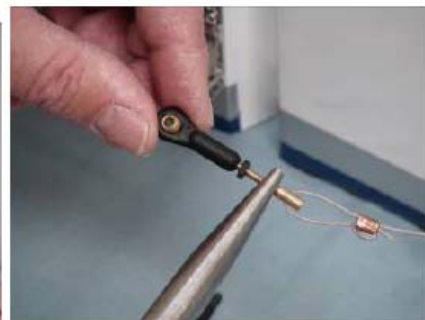
Hold the threaded coupler below the cable attach holes to thread into the ball link as shown.

Attach ball link to rudder control horn on both sides of the rudder.

Adjust rudder pull-pull cables to desired tension by screwing in or out on the threaded couplers and or ball links.

Make all adjustments with the rudder servos still powered up and cantered, and the rudder still taped in the neutral position.

Ensure the servo does not bind at centre or at either end point.

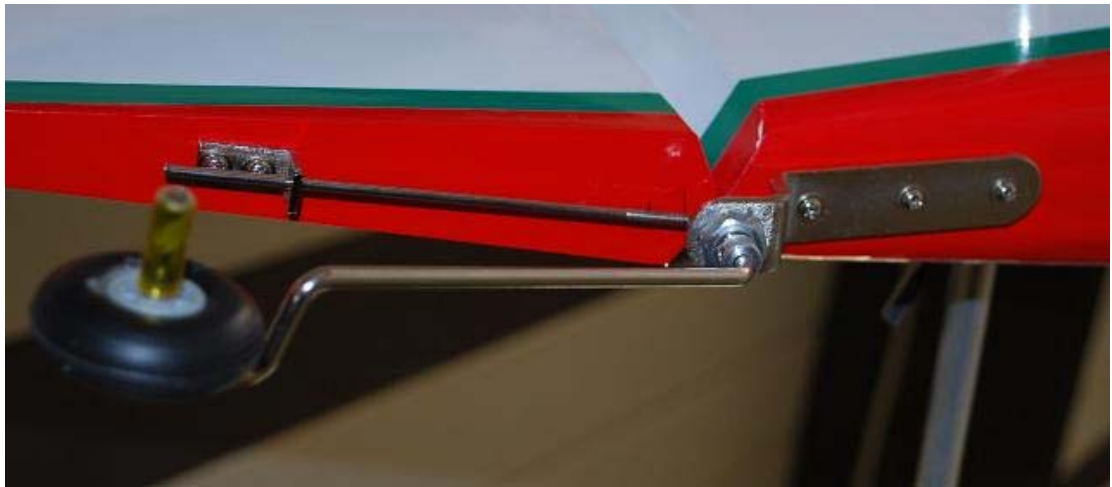


TAIL WHEEL ASSEMBLY

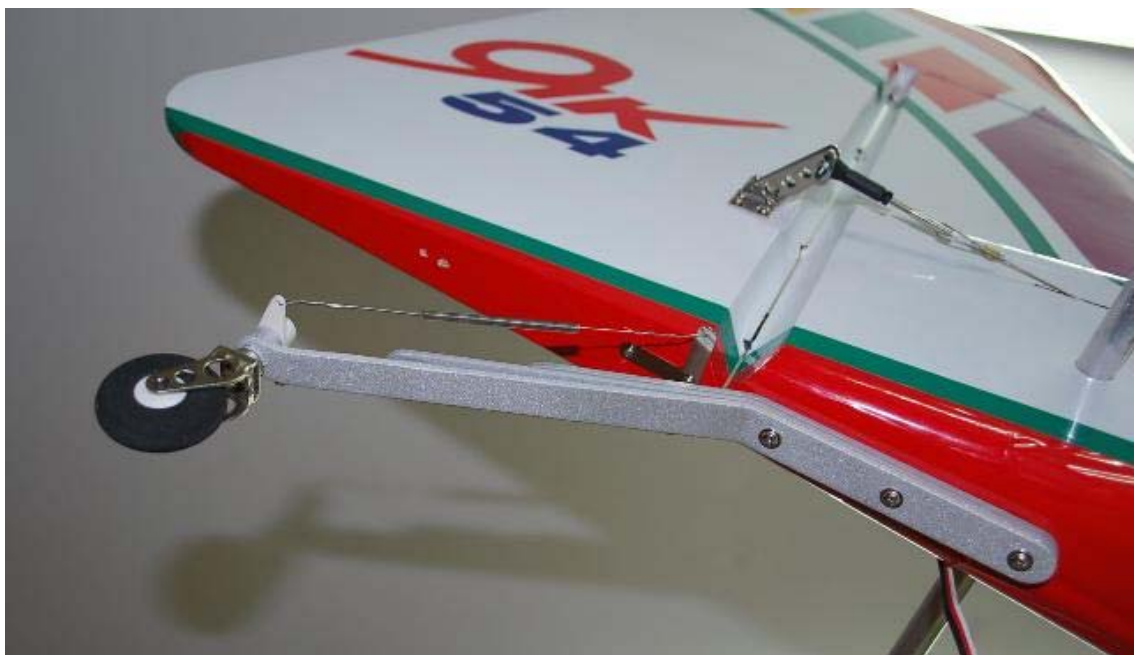
You can use the tail wheel supplied with the kit but it is recommended to use a large TY tail wheel assembly.

Due to the weight of the supplied tail wheel will make the model hard to balance.

If using the tail wheel supplied mount with self tappers as in picture below.



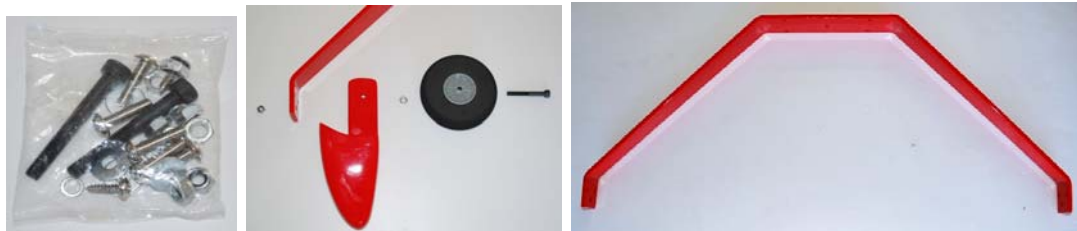
Fit the TY tail wheel as shown in picture below with self tappers.



UNDERCARRIAGE

Gather the landing gear parts as shown below.

Landing gear strut, 5 mounting bolts, washers, and lock washers, 2 wheels and 2 axles as shown below.

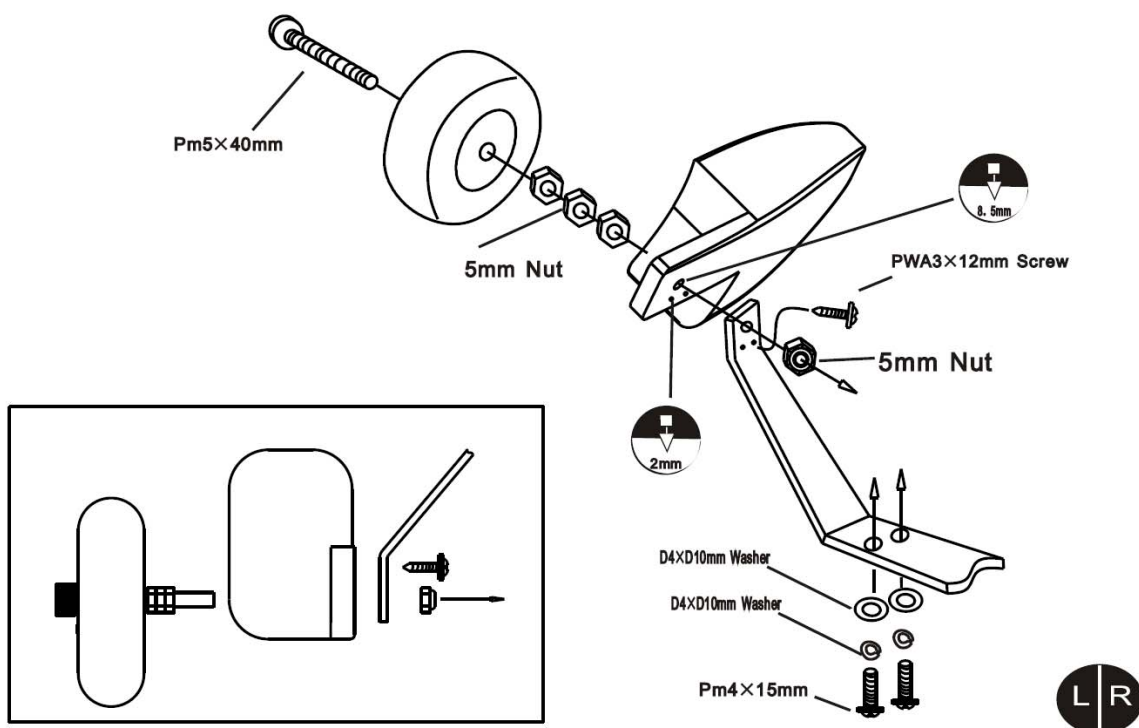


Bolt landing gear strut to fuse with 5 bolts and washers.

Ensure tapered edge of the gear strut is facing toward the rear.



Assemble wheels and wheel pants on to landing gear as shown in picture below.



WINGS

Glue aileron hinges in the same as you did for the rudder and the elevators.



Use a hot wire to remove the covering from the wing where the servo hole is.

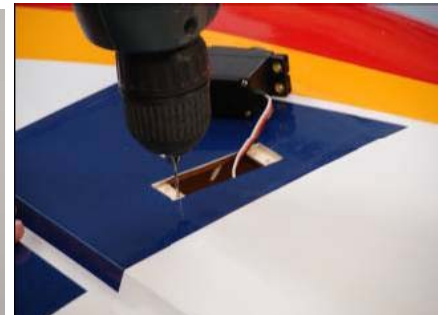
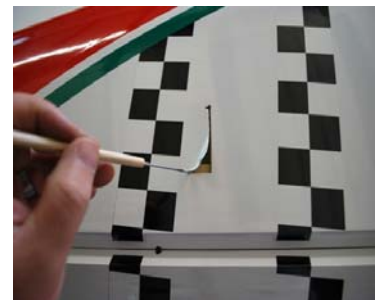
Attach the TY extension to the servo lead and secure with a TY safety lock

Fasten the pull string from the servo hole to the male plug of the servo extension. Secure with tape so that the strings pulls from the front end of the plug.

Taper the tape to avoid hang-ups inside the wing.

Draw the servo extension through the wing and pull through the wing root rib.
Install servo in servo well with the Air Wild output arm toward the leading edge of the wing and mark locations of servo mounting holes.
Remove servo and use a 1/16 bit to drill servo mounting holes.
Install servo with servo mounting screws.

Aileron servo mounted in bottom of wing.



AILERON CONTROL LINKAGE INSTALLATION

Gather the aileron control linkage parts as shown.

There is 1 pushrod, 2 ball link assemblies, 1 left and 1 right side control horn, and 6 wood screws for each wing panel.

Assemble the pushrod and control horn assembly as shown.

The ball link goes between the left and right sides of the control horn sides and is secured with a nylon lock nut.

Start with the centre hole in the control horn.

The ball link may be moved up or down for more or less control throw.

Tape the inboard trailing edge of the aileron to the trailing edge of the wing in the neutral position.

Plug the servo into the receiver and turn on.

Ensure the servo is centred and the servo arm is parallel to the aileron hinge line.

Attach front ball link to servo arm. Adjust the length of the pushrod so that the leading edge of the control horn is aligned with the leading edge of the aileron.

Centre the control horn over the hard wood in the aileron and mark the position of the control horn mounting holes.

Use a 1/16" bit to drill the control horn mounting holes. Mount the control horn using six wood screws as shown.

Note: Use thin CA to lock screws in place

Ensure the servo does not bind at either end point at full deflection. A 1" servo arm is recommended for best results. A 1 1/4" servo arm is required for full deflection of the aileron 55° bevel.

The control horns have been purposely offset from 90 degrees to servo arm to allow for full servo strength at full deflection

Repeat all the above steps for the other wing.

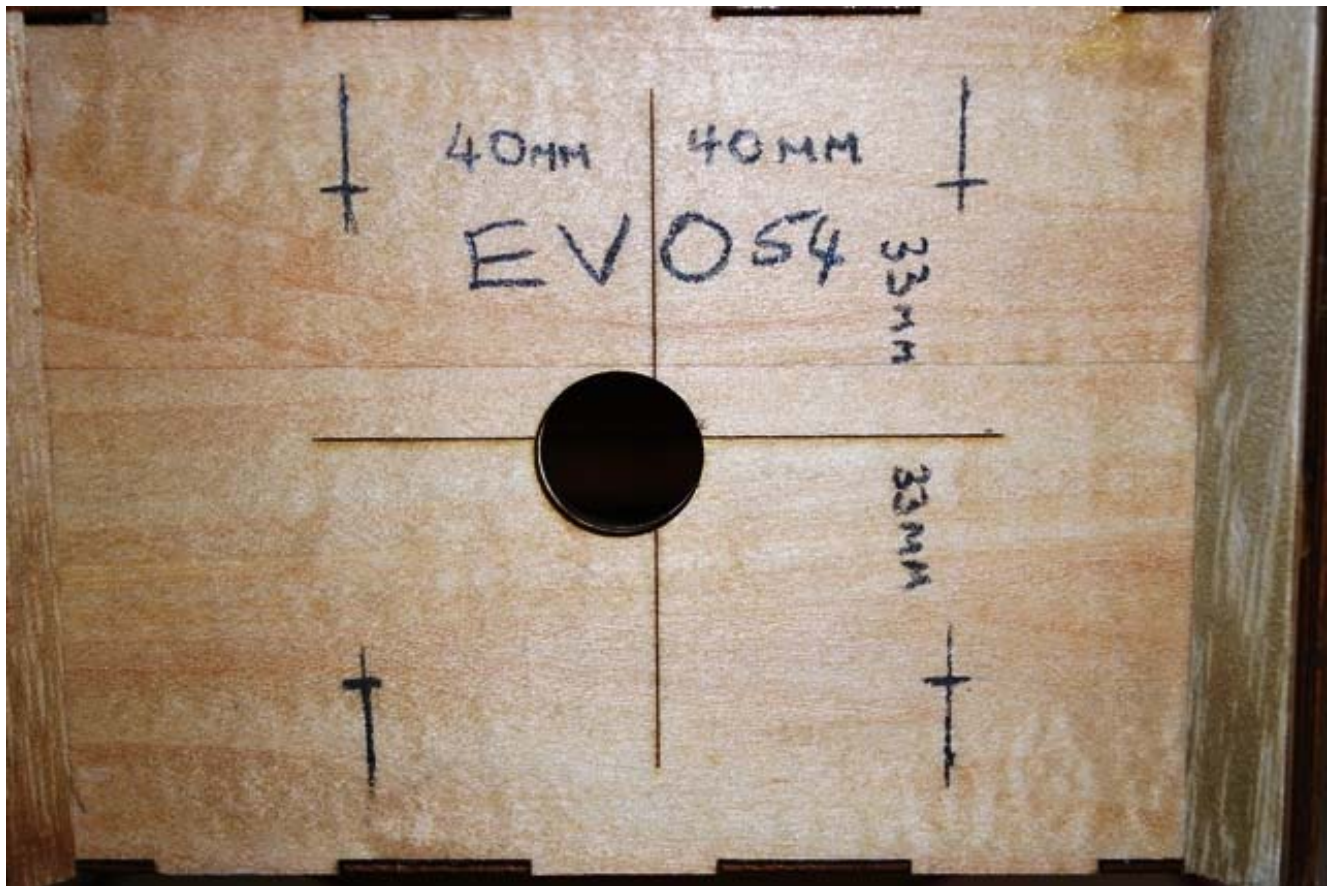


There are 4 wing bolts to retain wing on to fuselage as shown in picture below.



MOTOR ASSEMBLY

Use the picture below as a guide to mounting a EVO54 or a DL50 motor.



It is recommended to centre punch the location of the engine mounting holes prior to drilling.

Use a 1/4 drill to drill the engine mounting holes.

Gather the engine and mounting hardware as shown. 4 mounting bolts, 4 washers and 4 Stand offs.

Use a drop of blue lock tite on the engine mounting bolts prior to installing.

Due to the high variety of different engine selections and mounting preferences.

Engine mounting hardware is not included.

Insert the bolts through flat washers, the firewall and into the engine stand offs. Tighten firmly.

Be sure to use flat washers on the back side of the firewall to distribute bolt pressure.

Note to get the centre of gravity correct you will have to mount the motor as far forward as possible this will avoid in using nose weight.

Gather the plywood throttle servo mounting tray, the throttle servo, and pushrod parts.

Due to the wide range of engine and throttle hook up choices.

Throttle linkage hardware and set up is up to the builder. Refer to the photos as a guide.

There is a servo plate supplied but it will need to be reinforced to mount on to the side of the fuselage.

Use a 1/4 bit to drill a pushrod exit hole in the firewall in line with the engine carburettor throttle arm.

Attach the 2-56 ball link to the throttle pushrod and secure to the carburettor throttle arm with a 2-56 bolt and nylon lock nut.

The throttle servo is mounted on the side of the fuse that aligns with the engine carburettor throttle arm. Insert the throttle servo into the appropriate throttle servo mounting tray with the output arm forward. Insert the throttle pushrod into the servo arm easy link and dry fit inside the fuse.

Align the servo tray so there is no binding on the throttle pushrod.

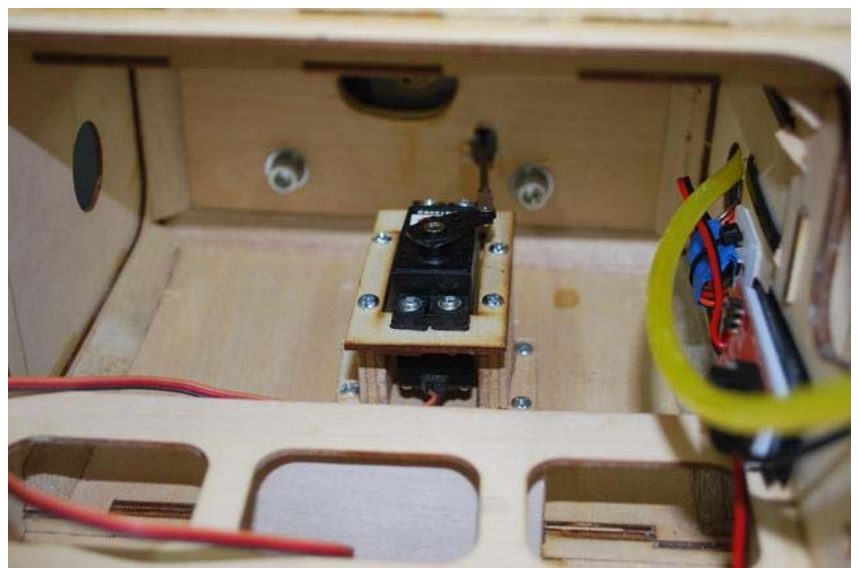
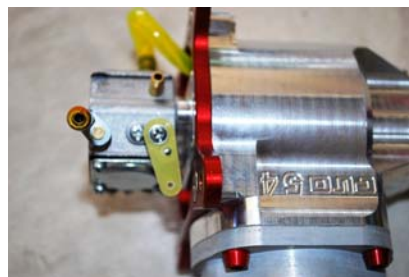
Mark the location of the servo mounting tray on the fuse side.

Prepare to epoxy the servo mounting tray to the fuse side. Apply epoxy to the back of the servo mounting tray.

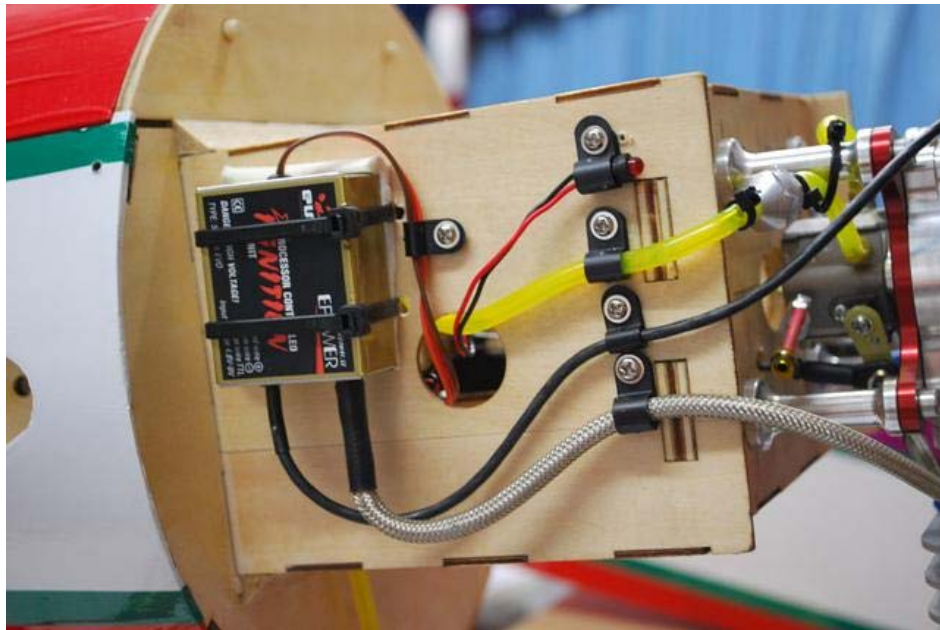
Install the servo mounting tray to the fuse side aligned with the marks.

Keep the pushrod away while allowing the epoxy to cure.

Insert the servo into the mounting tray and mark the location of the servo mounting holes.



Fit ignition module on side of engine box.



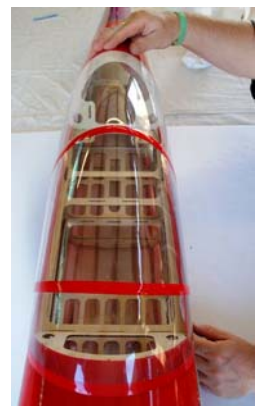
CANOPY

Fit canopy base to fuselage ready for the canopy to be glued on to base.

Use tape on fuselage to protect it from excess glue sticking canopy to fuselage.

Run a small bead of canopy glue all the way around the edge of the canopy.

Fit canopy to the canopy base and tape in position till dry.



MOUNTING COWL

There are four mounting blocks under covering of the fuselage.

Locate these blocks and mark with tape.

Centre the cowl in to position in reference to the prop driver.

Fit cowl in to position and drill pilot hole where the blocks are.

Secure cowl with screws supplied.



Cut cowl out to suit motor and muffler.

Assembly complete

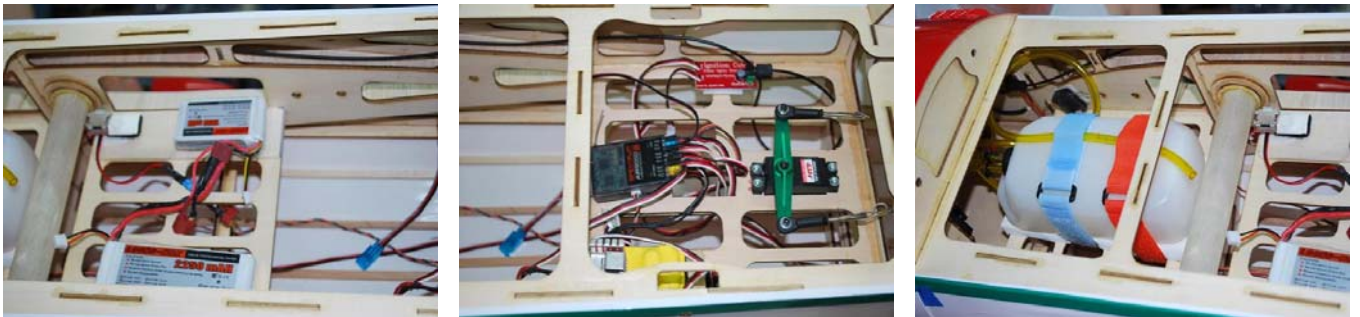
TIP

It is a good idea to go around the entire glue joint in the fuselage with the high performance (M100XF) glue for piece of mind.



RECEIVER LOCATION

Mount your receiver in place with Velcro.



Other Sportsman Aviation Models



PREFLIGHT PREPARATION

Center of Gravity

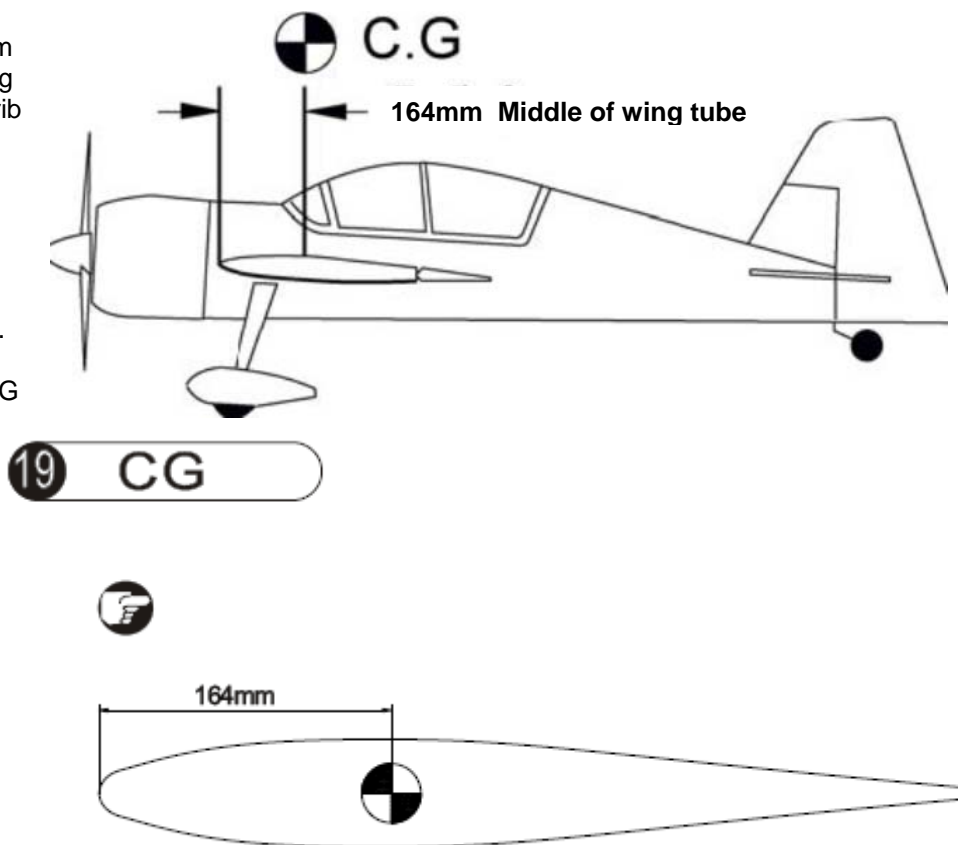
The recommended CG is 164mm from the leading edge of the wing measured along the outer wing rib at the wing tip.

Do not skip this step!

Balance the YAK along the CG line with your fingers. Make sure the plane is ready to fly less fuel.

Start at the forward end of the CG range until you are comfortable with the flight characteristics of the aircraft. You may find this a bit nose heavy at first but that is fine to start with. After you are comfortable adjust the CG to suit your flying style in small steps, especially when shifting the CG toward the tail.

For 3D flying a more aft balance point is better and for smooth pattern aerobatics a more forward CG is better. An aircraft that is too nose heavy does not fly well and is difficult to land. A tail heavy aircraft can be uncontrollable and will likely crash.



CONTROL THROWS

The amount of control throw should be adjusted using mechanical means as much as possible and then electronically with the radio. The control throws are shown in inches of deflection measured at the widest point of the control surface for both low and high rates. Aileron and elevator throws measurement in inches. Use a pen, ruler, and square to mark rudder throw measurement.

Control Throw Deflection

Low Rate:

Aileron 50mm up and 50mm down

Rudder 50mm left 50mm right

Elevator 25mm up 25mm down

For 3D flying use the following throws:

3D Rate

Aileron 80mm up 80mm down

Rudder 150mm left 150mm right

Elevator 100mm up 100mm down

We recommend 50% Expo on low rates and 70% expo on 3D rates as a starting point. You can adjust from there to suit your own flying style.

PREFLIGHT CHECKS

Center of Gravity: Check CG is set properly.

Motor: The motor should run smoothly at all power settings with smooth transition from low to high RPM. Do not fly with an unreliable motor. Completely read motor instructions before flying.

Flight Controls: Ensure all flight controls are free from binding and are centered. Check all hinges are tight and will not pull out. Control linkages must be rigid and tight and have no slop. Confirm proper direction of ailerons, rudder, and elevator. Experienced flyers have lost airplanes due to reversed ailerons. Right roll is right up, left down. Left roll is left up, right down.

Batteries: Make sure Transmitter and receiver/motor batteries are fully charged before each flight.

Fasteners: Check all motor screws, prop nuts, servo screws, control horns, wheel collars, and clevis keepers are tight and secure.

Radio: Check trims set to neutral and controls centered. Check rate and condition switches set properly. Check the receiver antenna is fully extended.

Range check: Do a range check with and without the motor running in accordance with the radio manufacturer instructions. If there is insufficient range or a large reduction with the motor running, do not fly until it is resolved!

FLIGHT TESTING

Plan the first flights with the CG in the forward part of the CG range. Use low rates or reduced throws until you are confident in the reactions to control inputs. After the first flight inspect the entire airplane for any loose fasteners or cracked joints. As you gain experience with the YAK move the CG back and increase control throws to the maximum for more extreme 3D aerobatics.

Proper set-up is important for good performance. Control linkages must be rigid and tight and have no slop to avoid flutter at high speed. Large flight controls and large control throws can produce extreme and exciting maneuvers but can also generate tremendous stress on the airplane if full deflections are used at high speeds. When flying at high speed use caution using full control deflections to avoid overstressing the airplane. The YAK is capable of any aerobatic maneuver. After you gain some confidence and experience flying the airplane you can cut loose and perform any maneuver you can think of. Here is a list of some of the more popular aerobatic and 3D maneuvers you can try:

- Loops and rolls
- Knife edge flight
- Stall turns
- Snap rolls
- 2, 4, and 8 point rolls
- Slow rolls
- Spins upright and inverted
- Flat Spins upright and inverted
- Harriers upright and inverted
- Water falls
- Torque RollsA
- Rolling circles



The sky and your imagination are your only limits.

See Enclosed DVD for more Hints & Tips and product information.

Available at your local hobby shop- Distributed in Australia by :-

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